Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20054

In the Matter of,	)	
	)	
Advanced Television Systems	)	MM Docket No. 87-268
and Their Impact upon the Existing	)	
Television Broadcast Service	)	

COMMENTS OF MOTOROLA

Motorola hereby responds to the *ex parte* presentation submitted by the Association of Maximum Service Television, Inc. (MSTV)[1] that proposes major modifications to the Table of Allotments for digital television (DTV) service that was originally adopted in the *Sixth Report and Order* of the above-captioned proceeding.[2]

Motorola recommends that the FCC reject the MSTV approach because it will reduce the ability of public safety and other wireless users to use the 746-806 MHz band (UHF-TV channels 60-69). Thus, MSTV's proposals are inconsistent with the Congressional decision to allocate this spectrum for public safety and commercial wireless uses. Further, MSTV's proposals will increase interference to existing land mobile users, including public safety, now operating at 470-512 MHz (UHF-TV channels 14-20) in certain markets. While some

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[1] FCC Seeks Comment on Filings Addressing Digital TV Allotments, MM Docket No. 87-268, Public Notice, released December 2, 1997.

[2] *In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service,* MM Docket No. 87-268, *Sixth Report and Order*, FCC 97-115 (adopted April 3, 1997, released April 21, 1997) (*hereinafter Sixth R&O).*

adjustments to the FCC's DTV allotment table may be appropriate and even desirable over time, the FCC must fully consider the impact to public safety and other land mobile users before deciding to adopt such major changes to the DTV allocation table.

I. Background

Motorola is a world-wide leader in the manufacturing of wireless communications devices such as cellular telephones, pagers, advanced messaging devices, and two-way radios for public safety and industrial applications. With annual revenues of approximately $30 billion dollars, Motorola's business interests demand that it maintain a keen focus on all spectrum management efforts. Since the mid-1980's, Motorola has participated in the FCC proceedings designed to foster more efficient use of the underutilized broadcast television spectrum and to accommodate the growing spectrum needs of public safety and other private wireless services.[3]

In 1987, the FCC was prepared to adopt rules to promote further sharing of the broadcast television spectrum by land mobile users. This action was postponed indefinitely when the broadcast industry reported at the eleventh hour that such further sharing would upset its previously undisclosed plans to migrate to high definition technology.[4] After 10 years of debate, technical analysis and study, the FCC and the broadcast industry have finally developed a plan to support the introduction of advanced digital television technologies that includes 1) an

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[3] *In the Matter of Further Sharing of UHF Television Band by Private Land Mobile Radio Services,* General Docket No. 85-172, *Notice of Proposed Rule Making,* 50 Fed. Reg. 25587 (June 20, 1985).

[4] *In the Matter of Further Sharing of UHF Television Band by Private Land Mobile Radio Services,* General Docket No. 85-172, *Order,* 2 FCC Rcd 6441 (1987).

industry developed transmission standard for DTV service[5], 2) FCC technical standards and construction policies to support DTV deployment[6], and 3) a table of DTV allotments that provides each eligible television station with a second 6 MHz channel to allow the transmission of both DTV and NTSC programming during the multi-year transition period.[7]

The above actions have allowed the FCC to return to its original focus of satisfying the growing spectrum needs of public safety and land mobile wireless users. Now under Congressional direction[8] to complete the reallocation of the 746-806 MHz band by the end of this month, the FCC is once again faced with reviewing eleventh hour information submitted by broadcast interests that attempts to justify the retention of spectrum now slated for reallocation. Citing the need for greater adjacent channel protection, the MSTV *ex parte* presentation contains a revised DTV Table of Allotments that proposes 357 changes (more than 20 percent) to the table originally adopted by the FCC. More importantly, the MSTV proposal increases the number of DTV allotments in channels 60-69 from 15 to 47.

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[5] *In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service,* MM Docket No. 87-268, *Fifth Report and Order*, FCC 97-115 (adopted April 3, 1997, released April 21, 1997) (*hereinafter Fifth R&O).*

[6] *Id.*

[7] *See* n.2.

[8] *Balanced Budget Act of 1997*, P.L. 105-33, §§ 3003, 3004 [Before January 1, 1998, the FCC must complete the reallocation the 746-806 MHz for public safety and commercial services. The law dictates that 24 MHz of this band be allocated for public safety with the remaining spectrum allocated for commercial services. The FCC must commence the assignment of public safety licenses by September 30, 1998. Competitive bidding for the commercial licenses must begin after January 1, 2001, and conclude by September 30, 2002.]

II. Adoption of the MSTV Table Of DTV Allotments will Negatively Impact the Use of the Spectrum by Public Safety and Other Wireless Users

Throughout this long proceeding, the FCC has made clear that one of its goals was to increase the efficient use of broadcast television spectrum by recovering significant portions for reallocation to other services.[9] Congress affirmed the validity of this goal by requiring the FCC to reallocate the 746-806 MHz band to public safety and commercial services by January 1, 1998.[10] Given the importance of the DTV proceeding to resolve critical issues for the public safety and other land mobile services, it is wholly appropriate for the FCC to solicit public comments on the resulting impact to those services from the MSTV proposals.

The FCC's Table of Allotments attempted to facilitate the early recovery of 746-806 MHz by minimizing the number of DTV allotments in channels 60-69. The MSTV *ex parte* presentation argues that its proposals will not frustrate the Government's reallocation plans. Specifically, MSTV states that its proposed amendments to the DTV allotment table will have "little impact on the availability of spectrum for public safety services because they are in congested areas in which the operation of public safety services will necessarily be limited by existing NTSC stations even if the DTV Table were adopted as-is."[11]

Motorola disagrees with MSTV's assessment and believes that the 47 allotments in channels 60-69 will reduce the ability of public safety to use the 746-806 MHz band during the

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[9] *Sixth R&O* at ¶1.

[10] *See n.8, supra.*

[11] *MSTV Ex Parte Submission* at 9.

DTV transition period. In the first instance, Motorola questions whether MSTV's analysis on DTV adjacent channel interference warrants major revisions to the FCC's Table of Allotments. According to the MSTV *ex parte* filing, a new table is required because the FCC planning factors for adjacent channel interference were based on interfering DTV signals which exhibited no out-of-band emissions.[12] To correct this, additional analyses were performed in which nonlinearity was added to the DTV signal to completely fill the RF mask defined by the FCC.[13] This approach led to a new DTV allocation table that created 47 DTV assignments in channels 60-69 compared to the 15 allotments contained in the FCC's table.

However, the MSTV submission reports elsewhere that "Reduction of out-of-band DTV spillage may be accomplished by high power amplifier linearity correction and/or use of a high-power bandpass filter. While linearity correction is a potential improvement in DTV out-of-band spillage, the use of high-power bandpass filters can provide reliable, consistent results, even when used alone."[14] Indeed, the MSTV submission contains figures verifying that filtering the DTV spectrum provides significant improvement to the adjacent channel issue.[15] With such

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[12] *MSTV Ex Parte Submission,* Appendix 2A, *An Evaluation of the FCC RF Mask for the Protection of DTV Signals from Adjacent Channel DTV Interference* (July 17, 1997).

[13] *Id.*

[14] *MSTV Ex Parte Submission*, Appendix 2, Exhibit 2B, *Analyzing the FCC's DTV Spectral Emission Mask and Potential Degradation to Adjacent Channels Due to Antenna Pattern Differences,* at 9.

[15] For example, one figure in exhibit 2C to Appendix 2 shows a filtered DTV spectrum approximately 25 dB below the unfiltered spectrum at the center of the adjacent channel (6 MHz away). *MSTV Ex Parte Submission*, Appendix 2, Exhibit 2C, *Digital Television Service Considerations and Allotment Principles,* at 60.

remedies readily available, the need for greater adjacent channel separations should be questioned.[16]

In any event, MSTV is correct in its implication that the 746-806 MHz band is highly contaminated with existing broadcast stations leaving it difficult for public safety to locate needed capacity in major markets during the DTV transition. However, the solution to this problem is a more aggressive schedule to remove NTSC operations, rather than a plan to add even more blocking allotments to the band. Further, it is imperative that the FCC adopt flexible assignment policies for public safety users that provide adequate protection to broadcast stations while affording greater opportunity for public safety deployment. As Motorola will further discuss in comments to the FCC's *Second Notice of Proposed Rule Making* in WT Docket No. 96-86,[17] the criteria currently used to facilitate shared use of the 470-512 MHz band is overly conservative and, if implemented at 746-806 MHz, would unduly limit public safety use of the band during the DTV transition.

Additional DTV allotments in channels 60-69 would limit such public safety flexibility. Motorola has analyzed the impact of replacing the existing DTV allotment table with that

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[16] Other factors will provide "real world" adjacent channel interference protection. For example, it is likely that for economic reasons, some DTV licensees may choose to operate with lesser operating power than authorized and thus reduce the level of adjacent channel emissions. Indeed, as previously recommended by Motorola, the FCC should require DTV licensees to report their actual operating power and only require public safety users to protect actual service areas rather than theoretical contours.

[17] *In the Matter of The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010 and Establishment of Rules and Requirements For Priority Access Service*, WT Docket No. 96-86, *Second Notice of Proposed Rulemaking*, released October 24, 1997.

proposed by MSTV to determine if at least one 6 megahertz channel pair would be available for public safety in the top 50 markets assuming different co-channel mileage separations from the broadcast facilities.[18] If, for example, land mobile base stations could be deployed as close as 130 kilometers to a co-channel television allotment, the FCC's Table of Allotments would provide 30 of the top 50 markets with at least one six megahertz channel pair available for immediate public safety deployment. Additional capacity would become available as incumbent TV stations transition out of channels 60-69. Under the MSTV proposal, this number is reduced to 23 which is nearly a 25 percent reduction. This analysis does not consider the opportunity for more advanced land mobile engineering solutions such as operating within a smaller portion of the six megahertz channel or operating in a non-standard channel pair arrangement, both of which could be utilized by public safety users to extract some level of capacity of this band in the most congested markets.

Adding 32 more DTV allotments in channels 60-69 will affect public safety flexibility to explore these potential deployment solutions. Further, contrary to the statement of MSTV, not all of the proposed DTV allotments in channels 60-69 are in congested areas. Some of the markets slated to receive these allotments include Rock Hill, South Carolina; Oklahoma City; Hazard Kentucky; Grundy, Virginia; and Greensboro, North Carolina. While these markets may not be spectrum deficient today, there is a greater probability that the public safety community and commercial users will have to protect these stations far beyond the December 31, 2006,

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[18] This analysis considered the availability of paired UHF-TV channels 63 and 68 and UHF-TV channels 64 and 69 for public safety use which is consistent with the proposals in WT Docket No. 96-86 (*see n. 12, supra*).

deadline for the DTV transition period.[19] Thus, these DTV allotments can remain indefinitely to frustrate nationwide deployment of public safety and commercial wireless services in the 746-806 MHz band.

The MSTV plan also increases adjacent channel interference problems for existing land mobile stations operating in the 470-512 MHz band.[20] Under the FCC's Table of Allotments, there are 10 DTV allotments that are "short-spaced" to land mobile channels. However, Motorola believes that most of these situations do not pose real world risks given the actual separation and terrain of the various assignments.[21] On the other hand, the MSTV proposal creates 17 short spacing situations. While many of these will likely prove to be similarly resolvable, MSTV does propose to allot a DTV station on channel 21 in Los Angeles that is only 25 kilometers from adjacent channel land mobile operations and a DTV station on channel 19 in

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[19] Under the *Balanced Budget Act of 1997,* broadcasters can request extensions of the December 31, 2006 DTV transition deadline and continue to operate over both of their six megahertz channels if 1) in the particular market, one or more of the television stations licensed to or affiliated with the four largest national television networks are not broadcasting a digital television signal, or 2) digital to analog converter technology is not generally available in the market, or 3) at least 15 percent of the television households in the market do not subscribe to a multichannel video programming distributor that carries one or more of the digital television service programming channels of each of the television stations broadcasting such a channel in such market or do not have a television set capable of receiving the digital television signals of local broadcast stations. It is probable that these extensions will be more necessary in smaller rural markets.

[20] Attached is a listing of DTV allotments short spaced to land mobile channels between UHF TV channels 14-20.

[21] The worst case sharing situation under the FCC Table of Allotments is the DTV allotment in New Brunswick, NJ (Channel 18) which is located 93 kilometers away from the adjacent channel land mobile allocation in Philadelphia.

Washington DC that is only 9 kilometers from adjacent channel land mobile operations. Deployment of these two DTV allotments will certainly cause harmful interference to existing land mobile stations.

III. Conclusion

The FCC should not adopt the MSTV substitute allotment table because it would reduce the ability of public safety users to utilize the 746-806 MHz band. Given that the MSTV proposals are not adequately justified, the FCC should instead proceed with its case-by-case deliberations of the pending petitions for reconsideration of the *Sixth R&O* in a manner that does not delay the deployment of DTV technology or eventual recovery of excess broadcast spectrum.

Respectfully Submitted,

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December 17, 1997

Land Mobile Channels 14-20 Sharing Problems FCC Adopted DTV Allotment Plan

DTV channel 15	NY ALBANY	interferes with LM channel 15 New York	at 224.3 km.
DTV channel 16	IL ROCKFORD	interferes with LM channel 15 Chicago	at 134.6 km.
DTV channel 21	CA SANTA BARBARA	interferes with LM channel 20 Los Angeles	at 166.1 km.
DTV channel 15	CA CERES	interferes with LM channel 16 San Fran.	at 130.2 km.
DTV channel 18	CA MODESTO	interferes with LM channel 17 San Fran.	at 153.4 km.
DTV channel 18	NJ NEW BRUNSWICK	interferes with LM channel 19 Philadelphia	at 93.1 km.
DTV channel 21	MD SALISBURY	interferes with LM channel 20 Philadelphia	at 166.1 km.
DTV channel 17	RI BLOCK ISLAND	interferes with LM channel 16 Boston	at 113.1 km.
DTV channel 16	MD HAGERSTOWN	interferes with LM channel 17 Washington, DC	at 136.6 km.
DTV channel 15	PA CLEARFIELD	interferes with LM channel 14 Pittsburgh	at 151.2 km.

Land Mobile Channels 14-20 Sharing Problems MSTV Proposed DTV Allotment Plan

DTV channel 14	NY ALBANY	interferes with LM channel 14 New York	at 224.3 km.
DTV channel 16	CT NEW HAVEN	interferes with LM channel 15 New York	at 110.8 km.
DTV channel 15	MA SPRINGFIELD	interferes with LM channel 15 New York	at 195.7 km.
DTV channel 16	IL ROCKFORD	interferes with LM channel 15 Chicago	at 134.6 km.
DTV channel 17	CA PALM SPRINGS	interferes with LM channel 16 Los Angeles	at 161.7 km.
DTV channel 21	CA LOS ANGELES	interferes with LM channel 20 Los Angeles	at 25.3 km.
DTV channel	CA	interferes with LM	at 130.2 km.

15	CERES	channel 16 San Francisco	
DTV channel 18	CA MODESTO	interferes with LM channel 17 San Francisco	at 153.4km.
DTV channel 19	DC WASHINGTON	interferes with LM channel 19 Philadelphia	at 199.5 km.
DTV channel 18	NJ NEW BRUNSWICK	interferes with LM channel 19 Philadelphia	at 93.1 km.
DTV channel 21	MD SALISBURY	interferes with LM channel 20 Philadelphia	at 166.1 km.
DTV channel 15	MA SPRINGFIELD	interferes with LM channel 14 Boston	at 131.3 km.
DTV channel 14	NY ALBANY	interferes with LM channel 14 Boston	at 215.5 km.
DTV channel 16	CT NEW HAVEN	interferes with LM channel 16 Boston	at 187.9 km.
DTV channel 15	MA SPRINGFIELD	interferes with LM channel 16 Boston	at 131.3 km.
DTV channel 17	ME BIDDEFORD	interferes with LM channel 16 Boston	at 119.5 km.
DTV channel 19	DC WASHINGTON	interferes with LM channel 18 Washington, D.C.	at 9.6 km.